

**The Economic Impact on Butte County of Anadromous Fish  
Restoration Program Actions on Agricultural Lands in the Butte Creek  
Watershed**

**U.S. Fish and Wildlife Service Contract Number 11332-9-G018**

**By**

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**April 2, 2001**

## **EXECUTIVE SUMMARY**

### **Project Scope**

#### **Purpose**

The purpose of this study is to augment the draft programmatic environmental assessment (PEA) prepared by the U.S. Fish and Wildlife Service for the restoration of anadromous fisheries and associated habitat within the Butte Creek watershed (USFWS 200). The PEA was prepared to assess restoration actions proposed under the Anadromous Fish Restoration Program (AFRP), which was authorized by section 3406(b)(1) of the Central Valley Project Improvement Act (CVPIA). This study provides a limited economic assessment of the Butte Creek actions with emphasis on action #19, which addresses land conservation and riparian habitat preservation and restoration. As stated in the PEA, existing studies support the establishment of a minimum riparian bandwidth of 300 feet from either side of a stream. That bandwidth recommendation was used to define a representative sample of land use types along Butte Creek (USFWS 2000). There is no implication in the PEA or this study that any specific lands will be acquired.

Acquisitions will be negotiated with landowners on a site-by-site basis, taking into account potential biological benefit as well as other factors, including channel capacity and impacts on adjacent landowners.

#### **Geographical Scope**

This study examines the potential economic impacts on Butte County of land acquisitions along a representative reach of Butte Creek, extending from highway 99 to the Sutter County line. Within this reach, encompassing 300 feet on both sides of the creek, there are currently 1217 acres in agricultural production (including 144 acres of grassland and 47 acres of barren land) (USFWS 2000). Production includes rice, orchards (walnuts, almonds, and prunes), and various row crops. For the years 1989-1998 Butte County averaged 480,836 acres in plant crops. Over that same period the mean annual deviation from the average was 6304 acres (Butte County 1998).

#### **Impacts Assessed**

The study examines the economic impacts of three actions designated for the Butte County study area. Economic impacts are direct and indirect effects on county employment, output, and property tax revenues. Actions included within the scope of the study are:

1. Public land acquisition and the subsequent removal of those lands from agricultural production.
2. Expenditures made in connection with restoration of riparian habitat.
3. Construction expenditures for various instream projects including fish screens, fish passage enhancements, and installation of spawning gravel. In the case of construction spending the impacts are not determined for Butte County. The lack of information linking direct construction expenditures to a specific county implies that this impact can be described as affecting the broader region rather than a particular county within the region.

## **Methodology**

### **General**

Employment and income projections are generated using IMPLAN. The model is an input-output model that projects the total employment and income effects of an initial change in output. Output changes applicable to this study include decreased agricultural production, reduced investment in orchard replanting, construction of instream projects, and restoration of riparian habitat.

### **Data and Assumptions**

#### **Impacts of Public Land Acquisition and Habitat Restoration**

##### **◆ Effects on agricultural production and property tax revenues.**

Calculation of gross revenues per acre requires data on land use, production per acre, and unit crop prices. Land use data is from the USFWS Programmatic Environmental Assessment (USFWS 2000). Agricultural yield and price data for Butte County are from the County Agricultural Crop Reports. The annual value per acre of lost agricultural production ranges from a low of \$9.44 (dry farmed pasture) to \$2033 (prunes).

##### **◆ Impact on Butte County property tax revenues**

The impact on Butte County property tax revenue depends on two factors. First, the mix of federal and state acquisitions affects the amount of in lieu taxes received by the county relative to the reduction in property tax payments from private landowners. Second, the land may be purchased outright by public agencies or the land may remain under private ownership while the right to impose restrictions on its use may be purchased. For purposes of this study we use the changes in property tax revenues for a mix of agencies and acquisition methods, and, the direct loss in county general fund revenues for each year on a per acre basis is \$1.26 in constant 1998 dollars.

#### **Other Impacts**

##### **◆ Instream construction expenditures**

There are a number of AFRP-related projects planned or already completed that fall within the boundaries of the study area. Investment expenditures allocated to Butte County total \$13,332,500. Of that amount \$12,192,500 has already been spent and the remaining \$1,140,000 is for projects scheduled for completion in 2000-2001.

##### **◆ Restoration costs for riparian habitat**

Per acre costs for active restoration of riparian habitat are projected at \$4996. The spending is spread over a three-year period with first, second, and third year expenditures of \$3376, \$912, and \$708, respectively (Carlson 2000). It is assumed that habitat on 20 percent of the land will be actively restored.

## **Study Results**

There is a \$1,394,515 annual output loss to Butte County due to conversion of agricultural land and \$1,029,634 of the loss is in the agricultural sector. The total annual loss of jobs in the county is 16.6 with 11.5 of those jobs lost in the agricultural sector. Restoration of riparian habitat generates an increase in Butte County Output of \$1,687,014 and creates 44.6 jobs in the county. Scheduled and completed construction

activity in the Butte Creek corridor generates an increase in regional output of \$20,923,873 and 290.4 jobs.

### **Conclusions**

In 1997 Butte County personal income was \$3,808,853,000, total industry output was \$6,319,095,000 (165.9 percent of county personal income), and county employment was 77,200 (EDD definition). For that same year the value of agricultural output and employment (U.S. Department of Commerce definition) in the agricultural sector were \$418,846,000 and 6247, respectively (IMPLAN 2000). The annual reductions in Butte County output and employment (including indirect and induced impacts), due to the removal of Butte Creek land from agricultural production, are 0.022 percent of total industry output for the county and 0.022 percent of county employment. Losses in the agricultural sector are 0.246 percent of output in the sector and 0.184 percent of sector employment.

Some of these losses are offset in the early years of the project by expenditures for instream construction and riparian habitat restoration. However, assuming a 10-year time frame for project completion, by the 11<sup>th</sup> year there are no significant ongoing offsets (other than potential benefits that have not been quantified at this point) to the output and employment losses from reduced agricultural production. For the year 2010 Butte County personal income is forecasted to increase to \$5,240,000,000 (1997\$) and county employment is projected to increase to 89,900 (CED 2000, Gallo 2000). Assuming the 1997 ratio of total industry output to county personal income, the annual output loss of \$1,394,515 is 0.016 percent of county output and 0.018 percent of county employment in the year 2010.

### **Changes from Earlier Drafts**

This is the third and final draft of this study. A number of revisions were made from the first to the second draft. Some text was added discussing other potential negative impacts, corrections were made to the property tax loss calculations, and the comparison of construction cost impacts with the annual agricultural losses was eliminated. In addition, due to objections from a number of reviewers, the scenario approach was dropped in favor of scheme that presents the agricultural production losses as an annual impact and the construction and habitat restoration as totals for the life of the project.

There is only one change from the second to the final draft. In the earlier versions of the study investment in orchard replanting was entered as a separate item in the impact assessment. When that was done the amount should have been subtracted from industry output. It was not and therefore the costs of orchard replanting were double counted in the measured impact. The correction resulted in a reduction in the annual impact on output of \$50,269 annually and lowered the estimated annual job losses by 1.3.

## **Introduction**

The purpose of this study is to examine the economic impact on Butte County of public land acquisitions in the riparian corridor (600 feet in width) along Butte Creek. The portion of the corridor located in Butte County contains a total of 3468 acres. It extends from the border of Lassen National Forest to the Sutter County line. The mix of land use varies from conifer forest (1470 acres) at the higher altitudes; to blue oak, foothill pine, mixed chaparral, and woody vegetation (657 acres) at lower elevations; to primarily agriculture (1217 acres) in the valley (USFWS 2000).

Proposed actions “include many of those recommended in the Central Valley Project Improvement Act’s (CVPIA) Anadromous Fish Restoration Program (AFRP) to augment cumulative efforts to at least double populations of anadromous fish in Central Valley streams” (USFWS 2000). The area designated for the proposed action “includes Butte Creek from the headwaters downstream to the historical confluence with the Sacramento River, and from the mouth of Butte Slough on lower Butte Creek, through the Sutter Bypass, to the confluence with the Feather River” (USFWS 2000). A number of projects are proposed within the area including preservation and restoration of riparian habitat, construction of fish screens, improvements designed to enhance fish passage, and replenishment of spawning gravel. Habitat restoration would likely involve lands currently in agricultural production within a corridor extending roughly 300 feet from each stream bank. The loss of agricultural production and the resulting impacts on county income and employment are the primary costs to the local economy.

## **Project Scope**

### **Geographical Scope**

The study area is limited to the valley portion of the riparian corridor that is located in Butte County and extends from near the town of Durham to the Sutter County line. Within that area there are currently an estimated 1217 acres in agricultural production (including 144 acres of grassland and 47 acres of barren land) (USFWS 2000). Production includes rice, orchards (walnuts, almonds, and prunes), and various row crops. Remote sensing survey data (CDFG et al. 1997) were used to delineate agricultural land uses into four broad categories. The categories include seasonally and permanently flooded agriculture (380 acres), non-flooded agriculture (494 acres), orchard/vineyard (152 acres), grassland (144 acres), and barren land (47 acres) (USFWS 2000). For the years 1989-1998 Butte County averaged 480,836 acres in plant crops. Over that same period the mean annual deviation from the average was 6304 acres (Butte County 1998).

### **Impacts Assessed**

The study examines the economic impacts of three actions designated for the Butte County study area. Economic impacts are direct and indirect effects on county employment, output, and tax revenues. Actions included within the scope of the study are:

1. Public land acquisition and the subsequent removal of those lands from agricultural production. Estimates of the direct impacts on Butte County property tax revenues are included in the impact assessment of the land acquisition process.
2. Expenditures made in connection with restoration of riparian habitat.
3. Construction expenditures for various instream projects including fish screens, fish passage enhancements, and installation of spawning gravel. In the case of construction spending the impacts are not determined for Butte County. The lack of information linking direct construction expenditures to a specific county implies that this impact can be described as affecting the broader region rather than a particular county within the region.

There are a number of potential benefits, the analysis of which is beyond the scope of this analysis. Enhancement of fish populations provides benefits to local anglers and the potential to attract additional visitors and spending in the county. The value of other recreational activities such as wildlife watching and hunting is enhanced by wildlife productivity associated with restored riparian habitat. Non-users also derive aesthetic benefits from the creation of diverse habitat, where viewable from public areas. Removing land from irrigation may free up water for other uses. That water can be used within the county or is available for sale outside of the County. While these benefits may be significant, the lack of data makes it impossible to obtain reliable estimates. In addition, the near term recreational benefits may be limited, as there is a lag between restoration of instream and riparian habitat, and the full impact on wildlife populations and aesthetic values.

There is also the potential for habitat restoration activities to impose additional costs on Agricultural operations located on adjacent lands. Wildlife populations enhanced by the expansion of habitat may cause damage to nearby agricultural operations. Recreational use due to more extensive riparian habitat raises trespass issues and an increase in use presents some risk of damage to irrigation systems and other critical structures. As in the case of potential benefits it is impossible to accurately forecast the impact on the costs associated with an additional 1217 acres of managed riparian habitat.

## **Methodology**

### **General**

Employment and income projections are generated using IMPLAN. The model is an input-output model that projects the total employment and output effects of an initial change in output. Output changes applicable to this study include decreased production of agricultural products, increased spending on instream construction projects, and increased spending on restoration of riparian habitat. Agricultural production, prices, and per acre yields are from the Butte County Agricultural Crop Reports for the years 1990 through 1998. Data for instream construction expenditures are from the U.S. Fish and Wildlife Service (USFWS). The estimated cost per acre for habitat restoration was provided by sources within Sacramento River Partners and The Nature Conservancy.

The economic impact of removing lands from agricultural production is estimated using the IMPLAN model. IMPLAN is a frequently used input-output (I-O) model (see

[http://www.mig-inc.com/about\\_us/clients.htm](http://www.mig-inc.com/about_us/clients.htm) for a list of state and federal government agencies, academic institutions, and private organizations using IMPLAN for impact assessment) that separates the economy into 528 sectors, classifying each according to the primary product or service it provides. The mechanism through which the model estimates impacts is the transaction matrix, which contains the purchases and sales that occur among the various sectors. The column entries are the purchases made by a particular sector from all other sectors included in the model. The row elements are the industry destinations of the sector's sales. The I-O model permits assessment of the total impact of an initial change in output for a basic industry, in this case agriculture.

Removing land from agricultural use has direct impacts on production and employment, and, secondary consequences for those sectors dependent upon activity in the farming sector. The impact on sectors related to agriculture is called the indirect effect and it is measured as the reduction in output or employment for all sectors selling to the agricultural sector. As income declines in agriculture and allied sectors, local consumer spending is also affected, leading to additional impacts on local business sales, output, and employment. These are the induced effects. The total impact is the sum of the direct, indirect, and induced effects.

Often the results of an I-O model are expressed in the form of a multiplier. The output multiplier is equal to the ratio of the direct, indirect, and induced impacts on output to the direct impact. IMPLAN generates Modified Type II multipliers, which are somewhat larger since they include the effect of transfer payments in the induced impacts. Direct, indirect, and induced employment impacts are calculated as the change in employment for each one million-dollar change in the output of a particular sector. Employment multipliers are then calculated in the same manner as the output multiplier, as the ratio of the total change (direct, indirect, and induced) in employment to the direct change. Output and employment multipliers are determined by the interrelationships specified in the transactions matrix. The magnitude of the derived multipliers also depends on the degree of self-sufficiency for the local region. Generally, the smaller the scale of the local economy, the smaller the output and employment multipliers. That is because for a small economy so many local needs are met through purchases from outside. Even for broadly defined regions, the value of output multipliers rarely approaches two. In the case of small economies that are not geographically isolated, output multipliers of less than 1.5 are to be expected.

## **Data and Assumptions**

### **Impacts of the Land Acquisition Process - Effects on Agricultural Production, and Property Tax Revenues.**

#### **♦ Agricultural production, product prices, and gross revenue per acre**

Calculation of gross revenues per acre requires data on land use, production per acre, and unit crop prices. Land use data is from the USFWS Programmatic Environmental Assessment (USFWS 2000). Agricultural yield and price data for Butte County are from the County Agricultural Crop Reports. Table 1 includes the land use data and the assumed mix of crops produced for each of the general land use categories. Table

2 contains the average (1990-1998) per acre revenues for each of the crops used to calculate the loss in agricultural output in the Butte Creek corridor.

**Table 1. Estimated acres by agricultural land use type and assumed crop mix in Butte County within a 600-foot corridor bordering Butte Creek.**

<b>Land Use Type</b> <sup>1</sup>	<b>Corridor Total (Acres)</b> <sup>2</sup>	<b>Assumed Crop Mix</b> <sup>3</sup>
Seasonally and Permanently Flooded Agriculture	380	100% Rice
Non flooded Agriculture	494	100% dry edible beans
Orchard/Vineyard	152	51% almonds, 18% prunes, and 31% walnuts
Grassland	144	Dry land pasture
Barren	47	Crop mix identical to the average for the corridor

1.USFWS 2000

2.USFWS 2000

3.Rice and dry beans are assumed to generate representative revenues for the associated land use type. The mix of orchard crops is equal to the average for Butte County in 1997 (USDA 1999).

**Table 2. Average revenue per acre for selected crops.**

<b>Crop</b>	<b>Revenue per Acre (1990-1998 average)</b>
Almonds	\$2017
Walnuts	\$1889
Prunes	\$2033
Rice	\$848
Dry Beans	\$597
Dry Pasture	\$9.44

The available data do not include specification of the actual crop mix for each land use category. For non-flooded agriculture dry beans were assumed to be the crop of choice due to the fact that it is commonly planted and generates revenue per acre at the high end of the possible options. In the case of orchards the weighted average of annual revenue per acre is \$1980.20, assuming that the mix of orchards is the same as the county average. That same revenue would also be generated from other combinations of orchard types such as 63.3 percent prunes and 36.6 percent walnuts. If the acreage were equally divided between walnuts and prunes, the average revenue per acre would be only slightly lower at \$1961 per acre. The highest possible revenue for the 152 acres of orchard land in the study area is \$309,016 for 100 percent prunes. The minimum is for 100 percent walnuts at \$287,128. The figure used to measure the impacts of removing the orchards from production is \$300,990. The relatively narrow range of possible values for direct losses implies that the assumed mix of orchards in the study area cannot be a significant source of error in the estimates.

#### ♦ **Impact on Butte County property tax revenues**

The impact on Butte County property tax revenue depends on two factors. First, the mix of federal and state acquisitions affects the amount of in lieu taxes received by



the county relative to the reduction in property tax payments from private landowners. Second, the land may be purchased outright by public agencies or the land may remain under private ownership while the right to impose restrictions on its use may be purchased. In the latter case the public agency is purchasing development rights (for example, the right to farm the land is purchased) but not taking title to the land.

There are significant differences in the way the state and federal governments calculate the amount of in lieu taxes owed to the counties. The state bases its payments on the assessed value of the land prior to acquisition and the county property tax rate for the year the land was purchased. There is no adjustment for inflation meaning the in lieu paid is unchanged over time. It would seem that inflation would eventually erode the real value of the state in lieu and it eventually does. However, since 100 percent of the amount paid goes to the county general fund (compared to 20 percent for property tax payments), the county receives a considerable windfall in the first 28 years following State land acquisition (Adams and Gallo 1999).

In the case of acquisition of private lands by federal agencies, county governments receive in lieu payments that are somewhat less than the taxes that would have been paid had the land remained in private ownership. The federal government pays 0.75 percent of the value of the land in the form of in lieu taxes and re-appraises the land every five years to reflect changes in market conditions. However, only 20 percent of the in lieu paid goes to the county general fund (the other 80 percent is paid to the state school fund) and budgetary considerations keep actual payments at an average of 80 percent of the amount due (Adams and Gallo 1999).

Where development rights are purchased but the landowner retains restricted title to the land, no in lieu taxes are paid. Property taxes are solely the responsibility of the landowner. If the sale of development rights reduces the value of the property, local property tax payments decrease. Of course if land uses allowable under the title restrictions (duck hunting clubs, for example) produce revenues equivalent to those of the options now unavailable (farming), then land values and property tax payments are unaffected.

Table 3 shows the impact on county property tax revenues of federal and state land acquisitions. The entries in the second and third columns are the differences between in lieu taxes paid to the county general fund (by the state and federal governments, respectively) and the property taxes paid to the general fund under continued private ownership. The fourth column is the amount paid to the general fund under continued private ownership. The last column is the change in county tax receipts for a hypothetical case involving direct purchase of two-thirds of the property, evenly divided between state and federal agencies, with purchase of development rights for the other one-third. The sale of the development rights is assumed to reduce the value of the property by 70 percent (Opinion of the Butte and Colusa County Assessors

Offices). All figures are on a per acre basis and are in constant 1998 dollars (Adams and Gallo 1999).

**Table 3. Impacts of state and federal property acquisitions on county general fund revenues per acre (1998 dollars)**

Years	State-Private	Federal-Private	Private	Scenario
0	\$7.37	\$0.19	\$2.42	\$1.96
10	\$3.22	-\$3.16	\$4.19	-\$0.96
20	\$1.83	-\$2.96	\$3.80	-\$1.26
30	-\$0.63	-\$4.56	\$5.06	-\$2.91

For purposes of this study we use the changes in general fund revenues for the scenario described and in the 20<sup>th</sup> year following property acquisition. Therefore the direct loss in Butte County's general fund for each year on a per acre basis is assumed to equal \$1.26 in constant dollars.

### **Instream Construction Expenditures**

There are a number of projects planned or already completed that fall within the boundaries of the study area. A detailed list of projects is included in Appendix B. Construction expenditures allocated to Butte County total \$13,332,500. Of that amount \$12,192,500 has already been spent and the remaining \$1,140,000 is for projects scheduled for completion in 2000-2001. Since no firm estimates were available for the cost of spawning gravel restoration or for ongoing maintenance and monitoring expenditures they are assumed to be zero. In addition a number of construction projects, completed and proposed, are associated with the AFRP but excluded from the analysis because they are located outside of the riparian corridor or the completion schedule is not firm (Sanborn Slough).

While construction activity in the riparian corridor clearly has a positive impact on Butte County output and employment, it is impossible to determine the precise size of the impact. That is because the proportion of the direct expenditures that occur within the county is unknown. The larger the share of expenditures allocated to firms located outside of the county, the smaller the direct effects on local output and employment. The same holds true of the indirect and induced impacts. That conclusion also holds for construction inside of the riparian corridor that is located outside of Butte County. Where the direct construction outlays occur in Glenn or Colusa County there is some spillover effect on Butte County. Some unknown portion of the indirect and induced impacts positively impacts every county in the region.

### **Restoration Costs for Riparian Habitat**

Per acre costs for active restoration of riparian habitat are projected at \$4996. The spending is spread over a three-year period with first, second, and third year expenditures of \$3376, \$912, and \$708, respectively (Carlson 2000). Estimates for restoration costs were provided from other sources. For large projects of 100 or 200 acres costs may be as low as \$3500 per acre, while for small projects they may approach \$10,000 per acre (TNC 2000 & 2000a). It is assumed that 20 percent of the land in the Butte Creek

corridor will be actively restored in relatively small units (at a cost of \$4996 per acre), with the remaining 80 percent designated for passive restoration, open flood channel, or as buffer to protect ongoing agricultural operations.

### **Model Output**

The model results are presented as if the expenditures for the three categories of impacts occur at a single point in time. Land acquisition, restoration of riparian habitat and loss of agricultural output, and instream construction are assumed to occur in the same year. For subsequent years annual losses of agricultural output, investment, and employment are presented as a uniform annual cost to the county.

### **Study Results**

Expenditures for construction and habitat restoration are assumed to take place in a single year. The only ongoing impact is the annual reduction in agricultural output and employment. The results are summarized in the following tables. Table 4 includes the direct, indirect, and induced effects on output for the initial changes in agriculture and restoration of riparian habitat. In Table 5 the employment impacts are presented for the same categories and separated into direct, indirect, and induced effects. Note that the impacts of habitat restoration and agricultural production decreases are not directly comparable, as the former is the total impact while the latter is the annual impact.

**Table 4. Direct, indirect, and induced impacts on output**

<b>Change</b>	<b>Direct</b>	<b>Indirect</b>	<b>Induced</b>	<b>Total</b>
<b>Agriculture (Annual)</b>	-\$956,540	- \$226,599	-\$211,375	-\$1,394,515
<b>Habitat Res. (Total)</b>	\$1,167,830	\$158,861	\$360,323	\$1,687,014

**Table 5. Direct, indirect and induced impacts on employment**

<b>Change</b>	<b>Direct</b>	<b>Indirect</b>	<b>Induced</b>	<b>Total</b>
<b>Agriculture (Annual)</b>	-9.4	-3.7	-3.5	-16.6
<b>Habitat Res. (Total)</b>	36.2	2.4	5.9	44.6

The purpose in presenting the data in this format is to provide a vehicle for discussing the gross impact of each activity on the various sectors of the Butte County economy. In the following discussion attention is focused on those sectors most affected, while greater detail is in the tables contained in Appendix A.

### **Reductions in Output and Employment Due to Conversion of Agricultural Land to Riparian Habitat**

Out of the \$1,394,515 annual output loss to Butte County due to conversion of agricultural land, \$1,029,634 of the loss is in the agricultural sector. The financial, services, and trade sectors are the next biggest losers with annual output reductions of \$98,273, \$88,568, and \$83,132, respectively. Using employment impacts yields a

somewhat different ranking of effects by sector. The total annual loss of jobs in the county is 16.6. While 11.5 of those jobs are lost in the agricultural sector, the trade and services sectors, with annual losses of 1.8 and 1.7 respectively, are the only other sectors showing a loss of one or more jobs.

The impacts on agricultural output and employment could be somewhat smaller if frequent flooding adversely affects productivity. The Nature Conservancy (TNC) provided output data for orchard lands within the Sacramento River Conservation Area (SRCA). The value of production for walnuts, was 70 percent of the Glenn County average (Table 6, TNC 2000b). The averages for almonds (59 percent) and prunes (52 percent) were considerably lower, but the small sample size limits the usefulness of the data. All of the orchards included in the sample were on parcels immediately adjacent to the Sacramento River.

**Table 6. Productivity of walnut orchards in the 100-year meander belt (1994-1999)**

<b>Year/number of Orchards</b>	<b>Acres in Sample</b>	<b>Total Income</b>	<b>Income/Acre</b>	<b>% of Glenn County Average</b>
1994/6	1220.0	\$732,776	\$600.64	30.96%
1995/3	435.5	\$434,567	\$997.86	77.05%
1996/5	1145.0	\$1,309,298	\$1143.49	87.76%
1997/5	1145.0	\$1,513,205	\$1321.58	68.55%
1998/7	1401.9	\$971,100	\$692.70	68.65%
1999/3	946.4	\$753,553	\$796.23	86.93%
			<b>Average</b>	<b>69.98%</b>

Assuming that flood impacts on agricultural productivity are limited to orchard lands, the annual impacts on county output are lower by almost \$90,000 annually. Additional impacts on crop yields for other land use types, for example due to the possibility that flooding may delay planting, would further reduce estimated output and employment losses.

#### **Gains in Output and Employment Due to Restoration of Riparian Habitat**

Habitat restoration activities generate an increase in Butte County output of \$1,687,014 and create 44.6 jobs in the county. Most of the increases, or \$1,196,856 and 36.8 jobs, are in the agricultural sector. Following agriculture the sectors experiencing the largest output effects are services, trade, and financial, with respective output gains of \$159,378, \$118,786, and \$98,803. Service sector employment increases by 3.2 and the trade sector gains 2.7 jobs.

#### **Gains in Output and Employment Due to Construction Activity in the Butte Creek Corridor**

Scheduled and completed construction activity in the Butte Creek corridor generates an increase in output of \$20,923,873. The bulk of the output effects are felt in the construction sector with an increase of \$13,250,120. The services, trade, and financial sectors also experience significant impacts on output, with respective increases of \$3,324,206, \$1,619,642, and \$1,246,515. The construction activity creates 290.4 jobs,

168.1 of which are in the construction sector. The other sectors with the largest employment gains are the services, trade, and financial sectors, with gains of 60.0, 39.4, and 8.1, respectively. However, the increase in output and employment is a one-time impact felt in the broader region. Given the data available, it is impossible to determine the proportion of that gain accruing to Butte County.

### **Other Considerations**

#### **Losses in Property Taxes**

In addition to the impacts on Butte County output and employment there will be some effect on local property tax collections. The annual loss to the general fund is \$1.26 per acre. That figure is from Table 4 for the 20<sup>th</sup> year and the scenario described. For the 1217 acres of agricultural land proposed for acquisition the annual losses in general fund revenues for Butte County are projected to equal \$1533.

#### **Additional Expenditures in the Project Area**

The output and employment projections presented assumed no additional spending for monitoring or maintenance. Monitoring expenses are included in the construction budgets. Expense information provided by the USFWS assumed a \$40,000 annual salary for a single warden to cover the four-county project area. One-fourth of that amount was allocated to Butte County's share of construction expenditures but was not included for the years beyond completion of the scheduled projects. Gravel replacement over the next 10 to 15 years is projected to cost \$131,650 (Prose 2000), with a total impact on regional output of \$207,879 and the creation of 2.9 jobs.

There is additional construction that is related to AFRP goals, but located outside of the portion of the Butte Creek riparian corridor delineated in the study scope. Expenditures within Butte County associated with the Durham Mutual Dam, the Centerville Dam, the PG&E diversion, and the Watershed Management Plan total \$1,551,000 and are excluded from the assessment.

#### **Potential Shifts in Agricultural Production**

The output and employment losses attributed to reductions in agricultural land availability should be considered an upper limit. Unless all of the currently available agricultural land is in use, some of the production may not be lost, but rather shifted to other land within the county. The mean deviation from the average amount of land in plant crops in Butte County was 6304 acres for the years 1989 through 1998 (Butte County 1998).

### **Conclusions**

Annual losses in county output due to decreases in agricultural production including indirect and induced impacts are \$1,394,515. Of that amount, \$1,029,634 represents decreases in production in the farm sector. Annual job losses are 16.6 full time jobs with 11.5 of those jobs lost in the agricultural sector. In 1997 Butte County personal income was \$3,808,853,000, total industry output was \$6,319,095,000 (165.9 percent of county personal income), and county employment was 77,200 (EDD definition). For that same year the value of agricultural output and employment (U.S. Department of Commerce

definition) in the agricultural sector were \$418,846,000 and 6247, respectively (IMPLAN 2000). The annual reductions in Butte County output and employment (including indirect and induced impacts), due to the removal of Butte Creek land from agricultural production, are 0.022 percent of total industry output for the county and 0.022 percent of county employment. Losses in the agricultural sector are 0.246 percent of output in the sector and 0.184 percent of sector employment.

Some of these losses are offset in the early years of the project by expenditures for instream construction and riparian habitat restoration. However, assuming a 10-year time frame for project completion, by the 11<sup>th</sup> year there are no significant ongoing offsets (other than potential benefits that have not been quantified at this point) to the output and employment losses from reduced agricultural production. For the year 2010 Butte County personal income is forecasted to increase to \$5,240,000,000 (1997\$) and county employment is projected to increase to 89,900 (CED 2000, Gallo 2000). Assuming the 1997 ratio of total industry output to county personal income, the annual output loss of \$1,394,515 is 0.016 percent of county output and 0.018 percent of county employment in the year 2010.

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## Appendix A

Table A-1. Direct, indirect, induced and total output generated by agriculture in the Butte Creek corridor, expressed in 1997 \$.

Sector Number <sup>1</sup>	Industry Sector	Direct Output <sup>2</sup>	Indirect Output <sup>3</sup>	Induced Output <sup>4</sup>	Total Output
1	Agriculture	-956,540	-71,777	-1,318	-1,029,634
28	Mining	0	-328	-104	-433
48	Construction	0	-11,361	-4,354	-15,715
58	Manufacturing	0	-19,531	-6,191	-25,722
433	Transport Comm Pub Util	0	-25,495	-20,149	-45,644
447	Trade	0	-31,141	-51,991	-83,132
456	Finance Insurance Real Estate	0	-47,947	-50,326	-98,273
463	Services	0	-16,825	-71,744	-88,568
510	Government	0	-2,194	-4,551	-6,746
516	Other	0	0	-648	-648
30001	Institutions	0	0	0	0
	Total	-956,540	-226,599	-211,375	-1,394,515

Table A-2. Direct, indirect, induced and total employment generated by agriculture in the Butte Creek corridor.

Sector Number	Industry Sector	Direct Employment	Indirect Employment	Induced Employment	Total Employment
1	Agriculture	-9.4	-2.1	0.0	-11.5
28	Mining	0.0	0.0	0.0	0.0
48	Construction	0.0	-0.2	-0.1	-0.3
58	Manufacturing	0.0	-0.1	-0.1	-0.2
433	Transport Comm Pub Util	0.0	-0.2	-0.1	-0.3
447	Trade	0.0	-0.4	-1.4	-1.8
456	Finance Insurance Real Estate	0.0	-0.4	-0.3	-0.6
463	Services	0.0	-0.3	-1.4	-1.7
510	Government	0.0	0.0	-0.1	-0.1
516	Other	0.0	0.0	-0.1	-0.1
30001	Institutions	0.0	0.0	0.0	0.0
	Total	-9.4	-3.7	-3.5	-16.6

<sup>1</sup> Sector numbers and industries are shown in detail in Appendix C.

<sup>2</sup> The direct output and employment originates with agriculture.

<sup>3</sup> The indirect output and employment is generated in all industries due to purchases by agriculture.

<sup>4</sup> The induced output and employment is generated in all industries due to increased spending by individuals.

## Appendix A

Table A-3. Direct, indirect, induced and total output generated by construction in the Butte Creek corridor, expressed in 1997 \$.

Sector Number <sup>5</sup>	Industry Sector	Direct Output <sup>6</sup>	Indirect Output <sup>7</sup>	Induced Output <sup>8</sup>	Total Output
1	Agriculture	0	22,205	28,363	50,569
28	Mining	0	906	2,249	3,155
48	Construction	14,229,043	34,746	93,444	14,357,232
58	Manufacturing	0	504,185	133,250	637,435
433	Transport Comm Pub Util	0	345,711	433,779	779,490
447	Trade	0	674,412	1,118,706	1,793,118
456	Finance Insurance Real Estate	0	320,905	1,081,174	1,402,079
463	Services	518,712	2,112,689	1,544,241	4,175,641
510	Government	19,758	44,924	97,934	162,616
516	Other	0	0	13,915	13,915
30001	Institutions	0	0	0	0
	Total	14,767,512	4,060,683	4,547,054	23,375,249

Table A-4. Direct, indirect, induced and total employment generated by construction in the Butte Creek corridor.

Sector Number	Industry Sector	Direct Employment	Indirect Employment	Induced Employment	Total Employment
1	Agriculture	0	1	0.5	1.5
28	Mining	0	0	0	0
48	Construction	180.2	0.6	1.4	182.1
58	Manufacturing	0	3.8	1.1	4.9
433	Transport Comm Pub Util	0	2.7	2.5	5.2
447	Trade	0	14.3	29.4	43.7
456	Finance Insurance Real Estate	0	3.1	5.9	9.1
463	Services	7.7	35.7	30.8	74.3
510	Government	0.5	1.3	1.5	3.3
516	Other	0	0	1.7	1.7
30001	Institutions	0	0	0	0
	Total	188.4	62.6	74.8	325.7

<sup>5</sup> Sector numbers and industries are shown in detail in Appendix C.

<sup>6</sup> The direct output and employment originates with past and future construction.

<sup>7</sup> The indirect output and employment is generated in all industries due to purchases by construction.

<sup>8</sup> The induced output and employment is generated in all industries due to increased spending by individuals.

## Appendix A

Table A-5. Direct, indirect, induced and total output generated by riparian restoration in the Butte Creek corridor, expressed in 1997 \$.

Sector Number <sup>9</sup>	Industry Sector	Direct Output <sup>10</sup>	Indirect Output <sup>11</sup>	Induced Output <sup>12</sup>	Total Output
1	Agriculture	4,379,363	100,416	8,433	4,488,212
28	Mining	0	321	670	991
48	Construction	0	56,271	27,704	83,975
58	Manufacturing	0	42,941	39,620	82,561
433	Transport Comm Pub Util	0	87,067	129,003	216,070
447	Trade	0	112,926	332,522	445,448
456	Finance Insurance Real Estate	0	49,650	320,860	370,510
463	Services	0	138,508	459,159	597,666
510	Government	0	7,630	29,111	36,741
516	Other	0	0	4,128	4,128
30001	Institutions	0	0	0	0
	Total	4,379,363	595,730	1,351,211	6,326,303

Table A-6. Direct, indirect, induced and total employment generated by riparian restoration in the Butte Creek corridor.

Sector Number	Industry Sector	Direct Employment	Indirect Employment	Induced Employment	Total Employment
1	Agriculture	135.9	1.9	0.2	137.9
28	Mining	0	0	0	0
48	Construction	0	0.9	0.4	1.4
58	Manufacturing	0	0.4	0.3	0.8
433	Transport Comm Pub Util	0	0.7	0.7	1.4
447	Trade	0	1.5	8.7	10.3
456	Finance Insurance Real Estate	0	0.5	1.8	2.3
463	Services	0	3	9.1	12.1
510	Government	0	0.2	0.4	0.6
516	Other	0	0	0.5	0.5
30001	Institutions	0	0	0	0
	Total	135.9	9.2	22.2	167.3

<sup>9</sup> Sector numbers and industries are shown in detail in Appendix C.

<sup>10</sup> The direct output and employment originates with agriculture services.

<sup>11</sup> The indirect output and employment is generated in all industries due to purchases by agriculture services.

<sup>12</sup> The induced output and employment is generated in all industries due to increased spending by individuals.

## Appendix A

Table A-7. Direct, indirect, induced and total output generated by agriculture, construction and riparian restoration in the Butte Creek corridor, expressed in 1997 \$.

Sector Number <sup>13</sup>	Industry Sector	Direct Output <sup>14</sup>	Indirect Output <sup>15</sup>	Induced Output <sup>16</sup>	Total Output
1	Agriculture	211,290	-24,607	26,302	212,985
28	Mining	0	576	2,086	2,661
48	Construction	13,136,555	33,617	86,626	13,256,798
58	Manufacturing	0	455,007	123,566	578,573
433	Transport Comm Pub Util	0	304,609	402,262	706,871
447	Trade	0	617,931	1,037,365	1,655,296
456	Finance Insurance Real Estate	0	244,652	1,002,393	1,247,045
463	Services	87,423	1,875,581	1,432,011	3,395,015
510	Government	19,758	37,656	90,814	148,228
516	Other	0	0	12,901	12,901
30001	Institutions	0	0	0	0
	Total	13,455,025	3,545,022	4,216,324	21,216,371

Table A-8. Direct, indirect, induced and total employment generated by agriculture, construction and riparian restoration in the Butte Creek corridor.

Sector Number	Industry Sector	Direct Employment	Indirect Employment	Induced Employment	Total Employment
1	Agriculture	26.9	-0.7	0.5	26.6
28	Mining	0.0	0.0	0.0	0.0
48	Construction	166.3	0.6	1.3	168.2
58	Manufacturing	0.0	3.5	1.0	4.5
433	Transport Comm Pub Util	0.0	2.4	2.3	4.7
447	Trade	0.0	13.1	27.2	40.4
456	Finance Insurance Real Estate	0.0	2.6	5.5	8.1
463	Services	1.3	31.6	28.5	61.5
510	Government	0.5	1.1	1.4	2.9
516	Other	0.0	0.0	1.5	1.5
30001	Institutions	0.0	0.0	0.0	0.0
	Total	195.0	54.2	69.3	318.5

<sup>13</sup> Sector numbers and industries are shown in detail in Appendix C.

<sup>14</sup> The direct output and employment originates with agriculture, construction and agriculture services.

<sup>15</sup> The indirect output and employment is generated in all industries due to purchases by agriculture, construction and agriculture services.

<sup>16</sup> The induced output and employment is generated in all industries due to increased spending by individuals.

## Appendix B

**Table B-1. Construction projects- estimated costs, amounts allocated to Butte County, and amounts allocated to IMPLAN industry sectors**

<b>County</b>	<b>Action item/Year</b>	<b>Project/ Location</b>	<b>IMPLAN Sector</b>	<b>Cost Total</b>	<b>Butte Co.</b>
Butte	6/1997	Remove Dam and Siphon/ WCWD Dam	50	8,419,000	8,419,000
Butte	7/1998	Remove Dam/ McGowan & McPherrin Dam	50	1,087,000	1,087,000
Butte	10/1998	Fish Ladder/ Adams Dam	50	680,000	680,000
Butte	11/1998	Fish Screen/ Adams Dam	50	467,000	467,000
Butte	12/1998	Fish Ladder/ Gorrill Dam	50	882,000	882,000
Butte	13/1998	Fish Screen/ Gorrill Dam	50	559,000	559,000
Butte/ Colusa	14/1998	Evaluation/ Sanborn Slough	506	52,000	26,000
Butte/ Colusa	EV5/1998	Evaluation/ Sanborn Slough	506	125,000	62,500
Butte/ Colusa	17/2001	Fish Screen/ White Mallard Dam	50	871,000	435,500
Butte/ Colusa	Final Alt/2001	Bifurcation Structure	50	970,000	485,000
All	Annual	Warden/ Four Counties	520	40,000	10,000
<b>Totals</b>				<b>14,571,000</b>	<b>13,332,500</b>

All data is from the USFWS, Butte Creek Actions and Evaluations: Detailed Cost Estimates (USFWS 1998)

## Appendix C

Table C-1. Direct<sup>1</sup>, indirect<sup>2</sup>, induced<sup>3</sup> and total output generated by agriculture in the valley reach of Butte Creek, Butte County expressed in 1997\$.

IMPLAN<sup>4</sup>

SectorIndustry	Direct	Indirect	Induced	Total
1 Dairy Farm Products	0	-7	-4	-11
2 Poultry and Eggs	0	-88	-6	-94
3 Ranch Fed Cattle	0	-104	-2	-106
4 Range Fed Cattle	0	-88	-2	-90
5 Cattle Feedlots	0	-40	0	-40
6 Sheep- Lambs and Goats	0	-9	0	-10
7 Hogs- Pigs and Swine	0	0	0	0
8 Other Meat Animal Products	0	0	0	0
9 Miscellaneous Livestock	0	-31	-77	-108
10 Cotton	0	0	0	0
11 Food Grains	-335,185	-1,766	-41	-336,991
12 Feed Grains	0	-3	0	-4
13 Hay and Pasture	-1,414	-21	-2	-1,436
14 Grass Seeds	0	0	0	0
15 Tobacco	0	0	0	0
16 Fruits	-58,064	-586	-355	-59,005
17 Tree Nuts	-255,112	-1,186	-157	-256,455
18 Vegetables	-306,765	-399	-138	-307,302
19 Sugar Crops	0	-4	0	-4
20 Miscellaneous Crops	0	-266	-49	-314
21 Oil Bearing Crops	0	-16	-3	-19
22 Forest Products	0	-12	-1	-12
23 Greenhouse and Nursery Products	0	-1,384	-77	-1,461
24 Forestry Products	0	0	0	0
25 Commercial Fishing	0	-1	-28	-29
Agricultural- Forestry- Fishery				
26 Service	0	-65,615	-130	-65,744
Landscape and Horticultural				
27 Services	0	-153	-245	-398
28 Iron Ores	0	0	0	-1
29 Copper Ores	0	0	0	0
30 Lead and Zinc Ores	0	0	0	0
31 Gold Ores	0	0	0	0
32 Silver Ores	0	0	0	0
33 Ferroalloy Ores- Except Vanadium	0	0	0	0
34 Metal Mining Services	0	0	0	0
35 Uranium-radium-vanadium Ores	0	0	0	0
Metal Ores- Not Elsewhere				
36 Classified	0	0	0	0

<sup>1</sup> The direct output originates with agriculture.

<sup>2</sup> The indirect output is generated in all industries due to purchases by agriculture.

<sup>3</sup> The induced output is generated in all industries due to increased spending by individuals.

<sup>4</sup> IMPLAN, "IMPLAN Professional 2.0", Minnesota IMPLAN Group Inc., 2000.

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
37 Coal Mining	0	-3	-4	-7
38 Natural Gas & Crude Petroleum	0	-303	-99	-402
39 Natural Gas Liquids	0	0	0	0
40 Dimension Stone	0	-22	-1	-23
41 Sand and Gravel	0	0	0	0
Clay- Ceramic- Refractory				
42 Minerals-	0	0	0	0
43 Potash- Soda- and Borate Minerals	0	0	0	0
44 Phosphate Rock	0	0	0	0
45 Chemical- Fertilizer Mineral Mining	0	0	0	0
Nonmetallic Minerals (Except				
46 Fuels)	0	0	0	0
47 Misc. Nonmetallic Minerals- N.E.C.	0	0	0	0
48 New Residential Structures	0	0	0	0
New Industrial and Commercial				
49 Build	0	0	0	0
50 New Utility Structures	0	0	0	0
51 New Highways and Streets	0	0	0	0
52 New Farm Structures	0	0	0	0
53 New Mineral Extraction Facilities	0	0	0	0
54 New Government Facilities	0	0	0	0
Maintenance and Repair-				
55 Residential	0	-1,479	-1,986	-3,465
Maintenance and Repair Other				
56 Facility	0	-9,850	-2,357	-12,207
Maintenance and Repair Oil and				
57 Gas	0	-33	-11	-43
58 Meat Packing Plants	0	0	0	0
Sausages and Other Prepared				
59 Meats	0	0	0	0
60 Poultry Processing	0	0	0	0
61 Creamery Butter	0	0	0	0
62 Cheese- Natural and Processed	0	0	0	0
63 Condensed and Evaporated Milk	0	0	0	0
64 Ice Cream and Frozen Desserts	0	0	0	0
65 Fluid Milk	0	0	0	0
66 Canned Specialties	0	0	0	0
67 Canned Fruits and Vegetables	0	-1	-216	-217
68 Dehydrated Food Products	0	0	-70	-70
Pickles- Sauces- and Salad				
69 Dressings	0	0	-19	-20
Frozen Fruits- Juices and				
70 Vegetables	0	-1	-2	-3
71 Frozen Specialties	0	0	-13	-13
Flour and Other Grain Mill				
72 Products	0	0	0	0
73 Cereal Preparations	0	0	-9	-9
74 Rice Milling	0	0	-28	-28
75 Blended and Prepared Flour	0	0	0	0
76 Wet Corn Milling	0	0	0	0
77 Dog- Cat- and Other Pet Food	0	0	0	0
78 Prepared Feeds- N.E.C	0	0	0	0
Bread- Cake- and Related				
79 Products	0	-2	-455	-458
80 Cookies and Crackers	0	-3	-740	-743

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
81 Sugar	0	0	0	0
82 Confectionery Products	0	0	-1	-1
83 Chocolate and Cocoa Products	0	0	0	0
84 Chewing Gum	0	0	0	0
85 Salted and Roasted Nuts & Seeds	0	-2	-177	-179
86 Cottonseed Oil Mills	0	0	0	0
87 Soybean Oil Mills	0	0	0	0
88 Vegetable Oil Mills- N.E.C	0	0	0	0
89 Animal and Marine Fats and Oils	0	-3	-5	-8
90 Shortening and Cooking Oils	0	0	0	0
91 Malt Beverages	0	0	-42	-42
92 Malt	0	0	0	0
93 Wines- Brandy- and Brandy Spirits	0	0	0	0
94 Distilled Liquor- Except Brandy	0	0	0	0
Bottled and Canned Soft Drinks &				
95 Wa	0	0	0	0
Flavoring Extracts and Syrups-				
96 N.E.C	0	0	0	0
97 Canned and Cured Sea Foods	0	0	0	0
Prepared Fresh Or Frozen Fish Or				
98 Sea	0	0	0	0
99 Roasted Coffee	0	-2	-208	-211
100 Potato Chips & Similar Snacks	0	0	0	0
101 Manufactured Ice	0	0	0	0
102 Macaroni and Spaghetti	0	0	0	0
103 Food Preparations- N.E.C	0	0	-145	-145
104 Cigarettes	0	0	0	0
105 Cigars	0	0	0	0
106 Chewing and Smoking Tobacco	0	0	0	0
107 Tobacco Stemming and Redrying	0	0	0	0
Broadwoven Fabric Mills and				
108 Finishi	0	-5	-12	-17
109 Narrow Fabric Mills	0	0	0	0
110 Womens Hosiery- Except Socks	0	0	0	0
111 Hosiery- N.E.C	0	0	0	0
112 Knit Outerwear Mills	0	0	0	0
113 Knit Underwear Mills	0	0	0	0
114 Knit Fabric Mills	0	0	0	0
115 Knitting Mills- N.E.C.	0	0	0	0
Yarn Mills and Finishing Of				
116 Textiles-	0	0	0	0
117 Carpets and Rugs	0	0	0	0
118 Thread Mills	0	0	0	0
119 Coated Fabrics- Not Rubberized	0	0	0	0
120 Tire Cord and Fabric	0	0	0	0
121 Nonwoven Fabrics	0	0	0	0
122 Cordage and Twine	0	0	0	0
123 Textile Goods- N.E.C	0	0	0	0
Apparel Made From Purchased				
124 Materi	0	-7	-70	-77
125 Curtains and Draperies	0	0	-3	-4
126 Housefurnishings- N.E.C	0	-3	-72	-74



IMPLAN<sup>4</sup>

Sector/Industry	Direct	Indirect	Induced	Total
127 Textile Bags	0	-447	-13	-460
128 Canvas Products	0	-99	-1	-101
129 Pleating and Stitching	0	0	0	0
130 Automotive and Apparel Trimmings	0	-2	-59	-61
131 Schiffi Machine Embroideries	0	0	0	0
Fabricated Textile Products-				
132 N.E.C.	0	-22	-64	-86
Logging Camps and Logging				
133 Contract	0	-107	-41	-148
Sawmills and Planing Mills-				
134 General	0	-336	-139	-475
Hardwood Dimension and Flooring				
135 Mi	0	0	0	0
136 Special Product Sawmills- N.E.C	0	0	0	0
137 Millwork	0	-166	-85	-250
138 Wood Kitchen Cabinets	0	-64	-49	-113
139 Veneer and Plywood	0	0	0	0
140 Structural Wood Members- N.E.C	0	-19	-11	-30
141 Wood Containers	0	-134	-1	-135
142 Wood Pallets and Skids	0	0	0	0
143 Mobile Homes	0	0	0	0
144 Prefabricated Wood Buildings	0	0	0	-1
145 Wood Preserving	0	-29	-16	-45
146 Reconstituted Wood Products	0	0	0	0
147 Wood Products- N.E.C	0	-252	-109	-361
148 Wood Household Furniture	0	0	-23	-23
149 Upholstered Household Furniture	0	0	0	0
150 Metal Household Furniture	0	0	0	0
151 Mattresses and Bedsprings	0	0	-192	-193
152 Wood Tv and Radio Cabinets	0	0	0	0
153 Household Furniture- N.E.C	0	0	0	0
154 Wood Office Furniture	0	0	0	0
155 Metal Office Furniture	0	0	0	0
156 Public Building Furniture	0	0	0	0
157 Wood Partitions and Fixtures	0	-3	-3	-6
158 Metal Partitions and Fixtures	0	0	0	-1
Blinds- Shades- and Drapery				
159 Hardwar	0	0	0	0
160 Furniture and Fixtures- N.E.C	0	0	0	0
161 Pulp Mills	0	0	0	0
162 Paper Mills- Except Building Paper	0	0	0	0
163 Paperboard Mills	0	0	0	0
164 Paperboard Containers and Boxes	0	-8,056	-151	-8,207
Paper Coated & Laminated				
165 Packaging	0	0	0	0
166 Paper Coated & Laminated N.E.C.	0	0	0	0
167 Bags- Plastic	0	0	0	0
168 Bags- Paper	0	0	0	0
169 Die-cut Paper and Board	0	0	0	0
170 Sanitary Paper Products	0	0	0	0
171 Envelopes	0	0	0	0
172 Stationery Products	0	0	0	0

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
173 Converted Paper Products- N.E.C	0	0	0	0
174 Newspapers	0	-530	-936	-1,466
175 Periodicals	0	-41	-99	-140
176 Book Publishing	0	-32	-156	-188
177 Book Printing	0	-1	-5	-6
178 Miscellaneous Publishing	0	-45	-89	-134
179 Commercial Printing	0	-130	-201	-331
180 Manifold Business Forms	0	0	0	0
181 Greeting Card Publishing	0	-1	-8	-9
182 Blankbooks and Looseleaf Binder	0	0	0	0
183 Bookbinding & Related	0	0	0	0
184 Typesetting	0	-2	-4	-6
185 Plate Making	0	0	0	0
186 Alkalies & Chlorine	0	0	0	0
187 Industrial Gases	0	0	0	0
188 Inorganic Pigments	0	0	0	0
189 Inorganic Chemicals Nec.	0	0	0	0
Cyclic Crudes- Interm. & Indus.				
190 Org	0	-22	-17	-39
191 Plastics Materials and Resins	0	0	0	0
192 Synthetic Rubber	0	0	0	0
193 Cellulosic Man-made Fibers	0	0	0	0
194 Organic Fibers- Noncellulosic	0	0	0	0
195 Drugs	0	0	0	0
196 Soap and Other Detergents	0	0	0	0
197 Polishes and Sanitation Goods	0	0	0	0
198 Surface Active Agents	0	0	0	0
199 Toilet Preparations	0	0	0	0
200 Paints and Allied Products	0	-33	-9	-41
201 Gum and Wood Chemicals	0	0	0	0
Nitrogenous and Phosphatic				
202 Fertilizer	0	0	0	0
203 Fertilizers- Mixing Only	0	0	0	0
204 Agricultural Chemicals- N.E.C	0	0	0	0
205 Adhesives and Sealants	0	0	0	0
206 Explosives	0	-3	0	-3
207 Printing Ink	0	0	0	0
208 Carbon Black	0	0	0	0
209 Chemical Preparations- N.E.C	0	-39	-13	-52
210 Petroleum Refining	0	-2,424	-350	-2,774
211 Paving Mixtures and Blocks	0	0	0	0
212 Asphalt Felts and Coatings	0	0	0	0
213 Lubricating Oils and Greases	0	0	0	0
Petroleum and Coal Products-				
214 N.E.C.	0	0	0	0
215 Tires and Inner Tubes	0	0	0	0
216 Rubber and Plastics Footwear	0	0	0	0
Rubber and Plastics Hose and				
217 Belting	0	0	0	0
Gaskets- Packing and Sealing				
218 Device	0	0	0	0

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
Fabricated Rubber Products-				
219 N.E.C.	0	0	0	0
220 Miscellaneous Plastics Products	0	-46	-11	-57
221 Leather Tanning and Finishing	0	0	0	0
222 Footwear Cut Stock	0	0	0	0
223 House Slippers	0	0	0	0
224 Shoes- Except Rubber	0	0	0	0
225 Leather Gloves and Mittens	0	0	0	0
226 Luggage	0	-1	-21	-22
227 Womens Handbags and Purses	0	0	0	0
228 Personal Leather Goods	0	0	0	0
229 Leather Goods- N.E.C	0	0	0	0
Glass and Glass Products- Exc				
230 Contai	0	-50	-125	-175
231 Glass Containers	0	0	0	0
232 Cement- Hydraulic	0	0	0	0
233 Brick and Structural Clay Tile	0	0	0	0
234 Ceramic Wall and Floor Tile	0	0	0	0
235 Clay Refractories	0	0	0	0
236 Structural Clay Products- N.E.C	0	0	0	0
237 Vitreous Plumbing Fixtures	0	0	0	0
238 Vitreous China Food Utensils	0	0	0	0
239 Fine Earthenware Food Utensils	0	0	0	0
240 Porcelain Electrical Supplies	0	0	0	0
241 Pottery Products- N.E.C	0	0	0	0
242 Concrete Block and Brick	0	0	0	0
243 Concrete Products- N.E.C	0	0	0	0
244 Ready-mixed Concrete	0	-1	-1	-2
245 Lime	0	0	0	0
246 Gypsum Products	0	0	0	0
247 Cut Stone and Stone Products	0	0	0	0
248 Abrasive Products	0	0	0	0
249 Asbestos Products	0	0	0	0
250 Minerals- Ground Or Treated	0	0	0	0
251 Mineral Wool	0	0	0	0
252 Nonclay Refractories	0	0	0	0
Nonmetallic Mineral Products-				
253 N.E.C	0	0	0	0
254 Blast Furnaces and Steel Mills	0	0	0	0
255 Electrometallurgical Products	0	0	0	0
256 Steel Wire and Related Products	0	0	0	0
257 Cold Finishing Of Steel Shapes	0	0	0	0
258 Steel Pipe and Tubes	0	0	0	0
259 Iron and Steel Foundries	0	0	0	0
260 Primary Copper	0	0	0	0
261 Primary Aluminum	0	0	0	0
262 Primary Nonferrous Metals- N.E.C.	0	0	0	0
263 Secondary Nonferrous Metals	0	0	0	0
264 Copper Rolling and Drawing	0	0	0	0
265 Aluminum Rolling and Drawing	0	0	0	0

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
Nonferrous Rolling and Drawing-				
266 N.E	0	0	0	0
Nonferrous Wire Drawing and				
267 Insulat	0	0	0	0
Aluminum Foundries				
268 Brass- Bronze- and Copper	0	0	0	0
Foundries				
269	0	0	0	0
Nonferrous Castings- N.E.C.				
270	0	0	0	0
Metal Heat Treating				
271	0	0	0	0
Primary Metal Products- N.E.C				
272	0	0	0	0
Metal Cans				
273	0	0	0	0
Metal Barrels- Drums and Pails				
274	0	0	0	0
Cutlery				
275	0	0	0	0
Hand and Edge Tools- N.E.C.				
276	0	-27	-5	-33
Hand Saws and Saw Blades				
277	0	-117	-8	-126
Hardware- N.E.C.				
278	0	0	0	0
Metal Sanitary Ware				
279	0	0	0	0
Plumbing Fixture Fittings and Trim				
280 Heating Equipment- Except	0	0	0	0
Electric				
281	0	0	0	0
Fabricated Structural Metal				
282	0	-2	-1	-3
Metal Doors- Sash- and Trim				
283 Fabricated Plate Work (Boiler	0	0	0	0
Shops)				
284	0	-3	-1	-4
Sheet Metal Work				
285	0	-1	0	-1
Architectural Metal Work				
286	0	-4	-2	-6
Prefabricated Metal Buildings				
287	0	0	0	0
Miscellaneous Metal Work				
288 Screw Machine Products and	0	0	0	0
Bolts- Et				
289	0	-2	-1	-3
Iron and Steel Forgings				
290	0	0	0	0
Nonferrous Forgings				
291	0	0	0	0
Automotive Stampings				
292	0	0	0	0
Crowns and Closures				
293	0	0	0	0
Metal Stampings- N.E.C.				
294	0	-3	-4	-7
Plating and Polishing				
295	0	-1	0	-1
Metal Coating and Allied Services				
296	0	-2	-1	-3
Small Arms Ammunition				
297 Ammunition- Except For Small	0	0	0	0
Arms-				
298	0	0	0	0
Small Arms				
299	0	0	0	0
Other Ordnance and Accessories				
300	0	0	0	0
Industrial and Fluid Valves				
301	0	0	0	0
Steel Springs- Except Wire				
302	0	0	0	0
Pipe- Valves- and Pipe Fittings				
303 Miscellaneous Fabricated Wire	0	-2	-1	-2
Produ				
304	0	-7	-2	-9
Metal Foil and Leaf				
305	0	0	0	0
Fabricated Metal Products- N.E.C.				
306	0	0	0	0
Steam Engines and Turbines				
307 Internal Combustion Engines-	0	0	0	0
N.E.C.				
308	0	0	0	0
Farm Machinery and Equipment				
309	0	-5,290	-39	-5,329
Lawn and Garden Equipment				
310	0	0	0	0

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
Construction Machinery and				
311 Equipme	0	-17	-3	-20
312 Mining Machinery- Except Oil Field	0	0	0	0
313 Oil Field Machinery	0	0	0	0
314 Elevators and Moving Stairways	0	0	0	0
Conveyors and Conveying				
315 Equipment	0	0	0	0
316 Hoists- Cranes- and Monorails	0	0	0	0
317 Industrial Trucks and Tractors	0	0	0	0
Machine Tools- Metal Cutting				
318 Types	0	0	0	0
Machine Tools- Metal Forming				
319 Types	0	-5	-1	-5
320 Industrial Patterns	0	0	0	0
Special Dies and Tools and				
321 Accessori	0	-28	-7	-35
322 Power Driven Hand Tools	0	0	0	0
323 Rolling Mill Machinery	0	0	0	0
324 Welding Apparatus	0	0	0	0
325 Metalworking Machinery- N.E.C.	0	0	0	0
326 Textile Machinery	0	0	0	-1
327 Woodworking Machinery	0	-11	-9	-20
328 Paper Industries Machinery	0	0	0	0
329 Printing Trades Machinery	0	0	0	0
330 Food Products Machinery	0	-4	-5	-9
331 Special Industry Machinery N.E.C.	0	-114	-27	-141
332 Pumps and Compressors	0	-53	-11	-64
333 Ball and Roller Bearings	0	0	0	0
334 Blowers and Fans	0	0	0	0
335 Packaging Machinery	0	0	0	0
336 Power Transmission Equipment	0	0	0	0
337 Industrial Furnaces and Ovens	0	0	0	0
General Industrial Machinery-				
338 N.E.C	0	0	0	0
339 Electronic Computers	0	0	0	0
340 Computer Storage Devices	0	0	0	0
341 Computer Terminals	0	0	0	0
342 Computer Peripheral Equipment-	0	0	0	0
Calculating and Accounting				
343 Machine	0	0	0	0
Typewriters and Office Machines				
344 N.E	0	0	0	0
345 Automatic Merchandising Machine	0	0	0	0
346 Commercial Laundry Equipment	0	0	0	0
Refrigeration and Heating				
347 Equipment	0	0	0	0
348 Measuring and Dispensing Pumps	0	0	0	0
349 Service Industry Machines- N.E.C.	0	0	0	0
Carburetors- Pistons- Rings-				
350 Valves	0	0	0	0
351 Fluid Power Cylinders & Actuators	0	0	0	0
352 Fluid Power Pumps & Motors	0	0	0	0
353 Scales and Balances	0	0	0	0
354 Industrial Machines N.E.C.	0	-4	-1	-5

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
355 Transformers	0	0	0	0
Switchgear and Switchboard				
356 Apparatus	0	0	0	0
357 Motors and Generators	0	0	0	0
358 Carbon and Graphite Products	0	0	0	0
359 Relays & Industrial Controls	0	-1	-1	-2
Electrical Industrial Apparatus-				
360 N.E.C.	0	0	0	0
361 Household Cooking Equipment	0	0	0	0
Household Refrigerators and				
362 Freezers	0	0	0	0
363 Household Laundry Equipment	0	0	0	0
364 Electric Housewares and Fans	0	0	-1	-1
365 Household Vacuum Cleaners	0	0	0	0
366 Household Appliances- N.E.C.	0	0	0	0
367 Electric Lamps	0	0	0	0
368 Wiring Devices	0	0	0	0
369 Lighting Fixtures and Equipment	0	0	0	0
370 Radio and TV Receiving Sets	0	0	0	0
371 Phonograph Records and Tape	0	0	0	0
Telephone and Telegraph				
372 Apparatus	0	0	0	0
Radio and Tv Communication				
373 Equipm	0	-24	-82	-106
Communications Equipment				
374 N.E.C.	0	-25	-86	-111
375 Electron Tubes	0	0	0	0
376 Printed Circuit Boards	0	-2	-4	-6
Semiconductors and Related				
377 Devices	0	0	0	0
378 Electronic Components- N.E.C.	0	-21	-51	-73
379 Storage Batteries	0	0	0	0
380 Primary Batteries- Dry and Wet	0	0	0	0
381 Engine Electrical Equipment	0	0	0	0
Magnetic & Optical Recording				
382 Media	0	0	0	0
383 Electrical Equipment- N.E.C.	0	0	0	0
384 Motor Vehicles	0	0	0	0
385 Truck and Bus Bodies	0	0	0	0
Motor Vehicle Parts and				
386 Accessories	0	-423	-254	-677
387 Truck Trailers	0	0	0	0
388 Motor Homes	0	-4	-14	-18
389 Aircraft	0	0	0	0
Aircraft and Missile Engines and				
390 Part	0	0	0	0
391 Aircraft and Missile Equipment-	0	-2	-3	-5
392 Ship Building and Repairing	0	0	0	0
393 Boat Building and Repairing	0	0	-1	-1
394 Railroad Equipment	0	0	0	0
395 Motorcycles- Bicycles- and Parts	0	-104	-16	-120
396 Complete Guided Missiles	0	0	0	0
397 Travel Trailers and Camper	0	0	0	0
398 Tanks and Tank Components	0	0	0	0

IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
399 Transportation Equipment- N.E.C	0	0	0	0
400 Search & Navigation Equipment	0	0	0	0
401 Laboratory Apparatus & Furniture	0	0	0	0
402 Automatic Temperature Controls	0	-20	-12	-32
403 Mechanical Measuring Devices	0	-14	-8	-22
404 Instruments To Measure Electricity	0	0	0	0
405 Analytical Instruments	0	0	0	0
406 Optical Instruments & Lenses	0	-2	-21	-23
407 Surgical and Medical Instrument	0	0	0	0
408 Surgical Appliances and Supplies	0	0	-18	-18
409 Dental Equipment and Supplies	0	-11	-82	-94
410 X-Ray Apparatus	0	0	0	0
411 Electromedical Apparatus	0	0	0	0
412 Ophthalmic Goods	0	0	0	0
413 Photographic Equipment and Supplies	0	0	0	0
414 Watches- Clocks- and Parts	0	0	0	0
415 Jewelry- Precious Metal	0	-2	-70	-72
416 Silverware and Plated Ware	0	0	0	0
417 Jewelers Materials and Lapidary	0	0	0	0
418 Musical Instruments	0	0	0	0
419 Dolls	0	0	0	0
420 Games- Toys- and Childrens	0	0	0	0
421 Vehicles	0	0	0	0
422 Sporting and Athletic Goods-	0	-1	-32	-33
423 N.E.C.	0	0	0	0
424 Pens and Mechanical Pencils	0	0	0	0
425 Lead Pencils and Art Goods	0	0	0	0
426 Marking Devices	0	0	0	0
427 Carbon Paper and Inked Ribbons	0	0	0	0
428 Costume Jewellery	0	0	0	0
429 Fasteners- Buttons- Needles- Pins	0	0	0	0
430 Brooms and Brushes	0	0	0	0
431 Signs and Advertising Displays	0	-8	-12	-20
432 Burial Caskets and Vaults	0	0	0	0
433 Hard Surface Floor Coverings	0	0	0	0
434 Manufacturing Industries- N.E.C.	0	-2	-4	-6
435 Railroads and Related Services	0	-2,012	-350	-2,362
436 Local- Interurban Passenger	0	-54	-753	-807
437 Transit	0	-54	-753	-807
438 Motor Freight Transport and	0	-11,459	-2,839	-14,298
439 Warehou	0	-1,223	-375	-1,598
440 Water Transportation	0	-612	-1,456	-2,068
441 Pipe Lines- Except Natural Gas	0	-367	-64	-432
442 Arrangement Of Passenger	0	-96	-270	-366
443 Transporta	0	-47	-15	-62
444 Transportation Services	0	-2,973	-5,096	-8,068
445 Communications- Except Radio	0	-689	-1,146	-1,835
446 and	0	-3,316	-5,720	-9,036
447 Radio and TV Broadcasting	0	-3,316	-5,720	-9,036
448 Electric Services	0	-3,316	-5,720	-9,036

IMPLAN<sup>4</sup>

Sector/Industry	Direct	Indirect	Induced	Total
444 Gas Production and Distribution	0	-699	-1,140	-1,839
Water Supply and Sewerage				
445 Systems	0	-62	-528	-590
Sanitary Services and Steam				
446 Supply	0	-1,887	-396	-2,283
447 Wholesale Trade	0	-30,175	-7,938	-38,112
448 Building Materials & Gardening	0	-48	-2,476	-2,524
449 General Merchandise Stores	0	-80	-4,137	-4,217
450 Food Stores	0	-164	-8,461	-8,625
Automotive Dealers & Service				
451 Station	0	-114	-5,900	-6,014
452 Apparel & Accessory Stores	0	-23	-1,209	-1,232
Furniture & Home Furnishings				
453 Stores	0	-48	-2,467	-2,515
454 Eating & Drinking	0	-357	-12,601	-12,958
455 Miscellaneous Retail	0	-132	-6,803	-6,935
456 Banking	0	-4,056	-9,044	-13,100
457 Credit Agencies	0	-1,603	-1,087	-2,690
458 Security and Commodity Brokers	0	-232	-1,197	-1,429
459 Insurance Carriers	0	-1,478	-3,845	-5,323
460 Insurance Agents and Brokers	0	-348	-904	-1,252
461 Owner-occupied Dwellings	0	0	-21,088	-21,088
462 Real Estate	0	-40,229	-13,161	-53,390
463 Hotels and Lodging Places	0	-1,175	-2,005	-3,180
Laundry- Cleaning and Shoe				
464 Repair	0	-308	-1,037	-1,344
465 Portrait and Photographic Studios	0	-36	-1,131	-1,167
466 Beauty and Barber Shops	0	0	-785	-785
467 Funeral Service and Crematories	0	0	-442	-442
468 Miscellaneous Personal Services	0	-7	-223	-230
469 Advertising	0	-192	-297	-489
470 Other Business Services	0	-923	-1,537	-2,460
Photofinishing- Commercial				
471 Photogra	0	-183	-359	-542
472 Services To Buildings	0	-695	-696	-1,391
473 Equipment Rental and Leasing	0	-1,792	-425	-2,217
474 Personnel Supply Services	0	-907	-1,148	-2,055
Computer and Data Processing				
475 Servic	0	-2,123	-2,241	-4,364
476 Detective and Protective Services	0	-21	-73	-95
477 Automobile Rental and Leasing	0	-242	-80	-322
478 Automobile Parking and Car Wash	0	-35	-283	-318
479 Automobile Repair and Services	0	-730	-3,170	-3,901
480 Electrical Repair Service	0	-333	-363	-696
Watch- Clock- Jewelry and				
481 Furniture	0	0	-11	-11
482 Miscellaneous Repair Shops	0	-2,974	-378	-3,352
483 Motion Pictures	0	-335	-1,646	-1,981
484 Theatrical Producers- Bands Etc.	0	-15	-106	-121
485 Bowling Alleys and Pool Halls	0	0	-160	-160
486 Commercial Sports Except Racing	0	-3	-12	-16
487 Racing and Track Operation	0	-81	-21	-103
Amusement and Recreation				
488 Services-	0	0	-2,239	-2,239



IMPLAN<sup>4</sup>

Sector Industry	Direct	Indirect	Induced	Total
Membership Sports and				
489 Recreation C	0	-36	-481	-517
490 Doctors and Dentists	0	0	-15,496	-15,496
491 Nursing and Protective Care	0	0	-2,344	-2,344
492 Hospitals	0	-13	-13,715	-13,728
493 Other Medical and Health Services	0	-3	-4,319	-4,322
494 Legal Services	0	-815	-2,448	-3,263
Elementary and Secondary				
495 Schools	0	0	-954	-954
496 Colleges- Universities- Schools	0	0	0	0
497 Other Educational Services	0	-25	-762	-787
498 Job Trainings & Related Services	0	-5	-391	-396
499 Child Day Care Services	0	0	-961	-961
500 Social Services- N.E.C.	0	0	-2,264	-2,264
501 Residential Care	0	0	-1,107	-1,107
502 Other Nonprofit Organizations	0	-14	-954	-968
503 Business Associations	0	-151	-114	-265
504 Labor and Civic Organizations	0	-2	-811	-813
505 Religious Organizations	0	0	-1,398	-1,398
506 Engineering- Architectural Services	0	-724	-379	-1,104
Accounting- Auditing and				
507 Bookkeepi	0	-1,546	-1,439	-2,986
Management and Consulting				
508 Services	0	-287	-403	-690
Research- Development & Testing				
509 Ser	0	-90	-133	-223
Local Government Passenger				
510 Transit	0	0	-2	-2
511 State and Local Electric Utilities	0	-25	-44	-69
Other State and Local Govt				
512 Enterprise	0	-1,505	-2,931	-4,436
513 U.S. Postal Service	0	-583	-1,285	-1,867
514 Federal Electric Utilities	0	0	0	0
Other Federal Government				
515 Enterprise	0	-82	-290	-372
516 Noncomparable Imports	0	0	0	0
517 Scrap	0	0	0	0
518 Used and Secondhand Goods	0	0	0	0
519 Federal Government - Military	0	0	0	0
520 Federal Government - Non-Military	0	0	0	0
521 Commodity Credit Corporation	0	0	0	0
State & Local Government -				
522 Educatio	0	0	0	0
State & Local Government - Non-				
523 Edu	0	0	0	0
524 Rest Of The World Industry	0	0	0	0
525 Domestic Services	0	0	-648	-648
526 Dummy	0	0	0	0
527 Dummy	0	0	0	0
528 Inventory Valuation Adjustment	0	0	0	0
25001 Foreign Trade	0	0	0	0
28001 Domestic Trade	0	0	0	0
Total	-956,540	-226,599	-211,375	-1,394,515